UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

NOKIA SOLUTIONS AND NETWORKS US LLC and NOKIA SOLUTIONS AND NETWORKS OY, Plaintiffs, v. HUAWEI TECHNOLOGIES CO. LTD. and HUAWEI DEVICE USA, INC. Defendants.	§ § § § § § § § § § § §	Case No. 2:16-cv-0753-JRG-RSP

CLAIM CONSTRUCTION
MEMORANDUM AND ORDER

On May 2, 2017, the Court held an oral hearing to determine the proper construction of the disputed claim terms in U.S. Patent Nos. 8,553,636 (the "'636 Patent") and 8,817,718 (the "'718 Patent") (collectively the "Asserted Patents"). The Court has considered the parties' claim construction briefing (Dkt. Nos. 69, 72, and 73) and arguments. Based on the intrinsic and extrinsic evidence, the Court construes the disputed terms in this Memorandum Opinion and Order. *See Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005); *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831 (2015).

BACKGROUND

Plaintiffs Nokia Solutions and Networks US LLC and Nokia Solutions and Networks OY (collectively "Nokia") assert the Asserted Patents against Defendants Huawei Technologies Co.

LTD. and Huawei Device USA, Inc., (collectively "Huawei").

The '636 Patent relates to communications in a cellular network. The Abstract of the '636 Patent recites:

> Channel selection for LTE-Advanced, or other, carrier aggregation can be performed by a method, apparatus, or computer-readable medium. According to certain embodiments, a method can include determining that channel selection and constellation selection are in use or to be used. The method can also include determining that a single mapping table design for channel selection for up to four bits is in use or to be used. The method can further include selecting a communication resource from resource entries corresponding to acknowledgment and negative acknowledgment states based on the determining that channel selection and constellation selection are in use or to be used and the determining that the single mapping table design for channel selection for up to four bits is in use or to be used.

'636 Patent Abstract. More particularly, the '636 Patent relates to the acknowledgement (ACK), negative acknowledgement (NACK) and discontinuous transmission (DTX) signals. For example, ACK and NACK signals may be used by user equipment (UE) to indicate either reception or no reception of a transmission sent to the UE by a base station. *See id*. at 1:15-42. The base station may send multiple transmissions to the UE and multiple ACK / NACK / DTX signals may be bundled together to provide a more efficient reporting of the ACK / NACK / DTX states. *See id*. at 1:23-42. The ACK / NACK / DTX states to be reported may be mapped to a single mapping table design for up to four ACK / NACK / DTX bits. The mapping table for n+1 acknowledgment, negative acknowledgment and/or discontinuous transmission bits includes the entries in the table for n acknowledgment, negative acknowledgment and/or discontinuous transmission bits, where n is an integer number of bits from 1 to 3. *Id*. at 1:45-59. In this manner a single mapping table design may be used for one bit, two bits, three bits and four bits. *Id*. at Table 2, 5:43-49. There may be situations in which the base station transmits four transmissions, but the UE only receives three (without knowledge of the fourth). The single mapping table design "nests" the results for

one bit, two bits, three bits and four bits so that in the event of lost transmissions uncertainty is not created between the UE and the base station.

The ’718 Patent relates to communications in a cellular network. The Abstract of the ’718 Patent recites:

> A user equipment locally stores a shift pattern that is specific to a cell to which the user equipment is currently attached, and processes a group of modulation symbols or bits for uplink transmission by a) cyclically shifting the modulation symbols or bits within the group according to the stored cell-specific shift pattern, and b) applying a spreading code to the group of symbols or bits. Different embodiments include spatial shifting and frequency bin shifting.

’718 Patent Abstract. More particularly, the ’718 Patent describes a process to mitigate interference between transmissions from adjacent cells of a wireless communication system, such as when two UEs in close proximity are transmitting to different base stations. *Id*. at 1:14-19. Generally, data sent from different UEs of a single cell is separated through the use of different spreading codes. However, there are not enough spreading codes to provide sufficient separation between transmissions from adjacent cells. *Id*. at 2:30-49. Thus interference may occur between UEs operating at the edge of one cell and UEs operating at the edge of an adjacent cell. *Id*. a 2:40-49. The techniques disclosed provide additional distinctions between the data transmissions by applying, not only spreading codes to the transmissions, but additionally shifting the data either before or after the application of the spreading codes. *Id*. at 3:10-30, Figures 3 and 4.

LEGAL PRINCIPLES

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*,

381 F.3d 1111, 1115 (Fed. Cir. 2004)). To determine the meaning of the claims, courts start by considering the intrinsic evidence. *Id.* at 1313; *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *Phillips*, 415 F.3d at 1314; *C.R. Bard, Inc.*, 388 F.3d at 861. The general rule—subject to certain specific exceptions discussed *infra*—is that each claim term is construed according to its ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the patent. *Phillips*, 415 F.3d at 1312–13; *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003); *Azure Networks, LLC v. CSR PLC*, 771 F.3d 1336, 1347 (Fed. Cir. 2014) ("There is a heavy presumption that claim terms carry their accustomed meaning in the relevant community at the relevant time.") (vacated on other grounds).

"The claim construction inquiry. . . begins and ends in all cases with the actual words of the claim." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998). "[I]n all aspects of claim construction, 'the name of the game is the claim.'" *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1298 (Fed. Cir. 2014) (quoting *In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998)). A term's context in the asserted claim can be instructive. *Phillips*, 415 F.3d at 1314. Other asserted or unasserted claims can also aid in determining the claim's meaning, because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim terms can also assist in understanding a term's meaning. *Id.* For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id.* at 1314–15.

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id.* (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc)). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Id.* (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). But, "'[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims.'" *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *see also Phillips*, 415 F.3d at 1323. "[I]t is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited." *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004).

The prosecution history is another tool to supply the proper context for claim construction because, like the specification, the prosecution history provides evidence of how the U.S. Patent and Trademark Office ("PTO") and the inventor understood the patent. *Phillips*, 415 F.3d at 1317. However, "because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes." *Id.* at 1318; *see also Athletic Alternatives, Inc. v. Prince Mfg.*, 73 F.3d 1573, 1580 (Fed. Cir. 1996) (ambiguous prosecution history may be "unhelpful as an interpretive resource").

Although extrinsic evidence can also be useful, it is "'less significant than the intrinsic record in determining the legally operative meaning of claim language.'" *Phillips*, 415 F.3d at 1317 (quoting *C.R. Bard, Inc.*, 388 F.3d at 862). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id.* at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition are entirely unhelpful to a court. *Id.* Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id.* The Supreme Court recently explained the role of extrinsic evidence in claim construction:

> In some cases, however, the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period. *See, e.g.*, *Seymour v. Osborne*, 11 Wall. 516, 546 (1871) (a patent may be "so interspersed with technical terms and terms of art that the testimony of scientific witnesses is indispensable to a correct understanding of its meaning"). In cases where those subsidiary facts are in dispute, courts will need to make subsidiary factual findings about that extrinsic evidence. These are the "evidentiary underpinnings" of claim construction that we discussed in *Markman*, and this subsidiary fact finding must be reviewed for clear error on appeal.

Teva Pharm. USA, Inc. v. Sandoz, Inc., 135 S. Ct. 831, 841 (2015).

A. Departing from the Ordinary Meaning of a Claim Term

There are "only two exceptions to [the] general rule" that claim terms are construed according to their plain and ordinary meaning: "1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of the claim term either

in the specification or during prosecution."[1] *Golden Bridge Tech., Inc. v. Apple Inc.*, 758 F.3d 1362, 1365 (Fed. Cir. 2014) (quoting *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012)); *see also GE Lighting Solutions, LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) ("[T]he specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal."). The standards for finding lexicography or disavowal are "exacting." *GE Lighting Solutions*, 750 F.3d at 1309.

To act as his own lexicographer, the patentee must "clearly set forth a definition of the disputed claim term," and "clearly express an intent to define the term." *Id.* (quoting *Thorner*, 669 F.3d at 1365); *see also Renishaw*, 158 F.3d at 1249. The patentee's lexicography must appear "with reasonable clarity, deliberateness, and precision." *Renishaw*, 158 F.3d at 1249.

To disavow or disclaim the full scope of a claim term, the patentee's statements in the specification or prosecution history must amount to a "clear and unmistakable" surrender. *Cordis Corp. v. Boston Sci. Corp.*, 561 F.3d 1319, 1329 (Fed. Cir. 2009); *see also Thorner*, 669 F.3d at 1366 ("The patentee may demonstrate intent to deviate from the ordinary and accustomed meaning of a claim term by including in the specification expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope."). "Where an applicant's statements are amenable to multiple reasonable interpretations, they cannot be deemed clear and unmistakable." *3M Innovative Props. Co. v. Tredegar Corp.*, 725 F.3d 1315, 1326 (Fed. Cir. 2013).

[1] Some cases have characterized other principles of claim construction as "exceptions" to the general rule, such as the statutory requirement that a means-plus-function term is construed to cover the corresponding structure disclosed in the specification. *See, e.g., CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1367 (Fed. Cir. 2002).

B. Functional Claiming and 35 U.S.C. § 112, ¶ 6 (pre-AIA) / § 112(f) (AIA)[2]

A patent claim may be expressed using functional language. *See* 35 U.S.C. § 112, ¶ 6; *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347–49 & n.3 (Fed. Cir. 2015) (en banc in relevant portion). Section 112, Paragraph 6, provides that a structure may be claimed as a "means . . . for performing a specified function" and that an act may be claimed as a "step for performing a specified function." *Masco Corp. v. United States*, 303 F.3d 1316, 1326 (Fed. Cir. 2002).

But § 112, ¶ 6 does not apply to all functional claim language. There is a rebuttable presumption that § 112, ¶ 6 applies when the claim language includes "means" or "step for" terms, and that it does not apply in the absence of those terms. *Masco Corp.*, 303 F.3d at 1326; *Williamson*, 792 F.3d at 1348. The presumption stands or falls according to whether one of ordinary skill in the art would understand the claim with the functional language, in the context of the entire specification, to denote sufficiently definite structure or acts for performing the function. *See Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1372 (Fed. Cir. 2015) (§ 112, ¶ 6 does not apply when "the claim language, read in light of the specification, recites sufficiently definite structure" (quotation marks omitted) (citing *Williamson*, 792 F.3d at 1349; Robert Bosch, LLC v. Snap-On Inc., 769 F.3d 1094, 1099 (Fed. Cir. 2014))); *Williamson*, 792 F.3d at 1349 (§ 112, ¶ 6 does not apply when "the words of the claim are understood by persons of ordinary skill in the art to have sufficiently definite meaning as the name for structure"); *Masco Corp.*, 303 F.3d at 1326 (§ 112, ¶ 6 does not apply when the claim includes an "act" corresponding to "how the function is performed"); *Personalized Media Communications, L.L.C. v. International Trade Commission*, 161 F.3d 696, 704 (Fed. Cir. 1998) (§ 112, ¶ 6 does not apply when the claim

[2] Because the applications resulting in the Asserted Patents were filed before September 16, 2012, the effective date of the AIA, the Court refers to the pre-AIA version of § 112.

includes "sufficient structure, material, or acts within the claim itself to perform entirely the recited function . . . even if the claim uses the term 'means.'" (quotation marks and citation omitted)).

When it applies, § 112, ¶ 6 limits the scope of the functional term "to only the structure, materials, or acts described in the specification as corresponding to the claimed function and equivalents thereof." *Williamson*, 792 F.3d at 1347. Construing a means-plus-function limitation involves multiple steps. "The first step . . . is a determination of the function of the means-plus-function limitation." *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311 (Fed. Cir. 2001). "[T]he next step is to determine the corresponding structure disclosed in the specification and equivalents thereof." *Id*. A "structure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim." *Id*. The focus of the "corresponding structure" inquiry is not merely whether a structure is capable of performing the recited function, but rather whether the corresponding structure is "clearly linked or associated with the [recited] function." *Id*. The corresponding structure "must include all structure that actually performs the recited function." *Default Proof Credit Card Sys. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1298 (Fed. Cir. 2005). However, § 112 does not permit "incorporation of structure from the written description beyond that necessary to perform the claimed function." *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999).

For § 112, ¶ 6 limitations implemented by a programmed general purpose computer or microprocessor, the corresponding structure described in the patent specification must include an algorithm for performing the function. *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999). The corresponding structure is not a general purpose computer but rather

the special purpose computer programmed to perform the disclosed algorithm. *Aristocrat Techs. Austl. Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008).

C. Definiteness Under 35 U.S.C. § 112, ¶ 2 (pre-AIA) / § 112(b) (AIA)[3]

Patent claims must particularly point out and distinctly claim the subject matter regarded as the invention. 35 U.S.C. § 112, ¶ 2. A claim, when viewed in light of the intrinsic evidence, must "inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). If it does not, the claim fails § 112, ¶ 2 and is therefore invalid as indefinite. *Id.* at 2124. Whether a claim is indefinite is determined from the perspective of one of ordinary skill in the art as of the time the application for the patent was filed. *Id.* at 2130. As it is a challenge to the validity of a patent, the failure of any claim in suit to comply with § 112 must be shown by clear and convincing evidence. *Id.* at 2130 n.10. "[I]ndefiniteness is a question of law and in effect part of claim construction." *ePlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 517 (Fed. Cir. 2012).

When a term of degree is used in a claim, "the court must determine whether the patent provides some standard for measuring that degree." *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1378 (Fed. Cir. 2015) (quotation marks omitted). Likewise, when a subjective term is used in a claim, "the court must determine whether the patent's specification supplies some standard for measuring the scope of the [term]." *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1351 (Fed. Cir. 2005); *accord Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014) (citing *Datamize*, 417 F.3d at 1351).

[3] Because the application resulting in the patent was filed before September 16, 2012, the effective date of the AIA, the Court refers to the pre-AIA version of § 112.

In the context of a claim governed by 35 U.S.C. § 112, ¶ 6, the claim is invalid as indefinite if the claim fails to disclose adequate corresponding structure to perform the claimed functions. *Williamson*, 792 F.3d at 1351–52. The disclosure is inadequate when one of ordinary skill in the art "would be unable to recognize the structure in the specification and associate it with the corresponding function in the claim." *Id.* at 1352.

AGREED TERMS

The parties agreed to the following term:

Term	Agreed Construction
"relative one to other" ('718 Patent Claims 3, 12)	"relative to one another"

(Dkt. No. 74-1 at 10-12.)

DISPUTED TERMS

1. **"processing, by a user equipment, in parallel a group of N modulated symbols in spreading factor (SF) pathways for uplink transmission" ('718 Patent Claim 1)**

   "process in parallel a group of N modulated symbols in spreading factor (SF) pathways for uplink transmission" ('718 Patent Claim 10)

Nokia's Proposed Construction	Huawei's Proposed Construction
Plain and ordinary meaning	"processing, by a user equipment, a group of N modulated symbols at the same time in spreading factor (SF) pathways for uplink transmission, where SF is more than one" "process a group of N modulated symbols at the same time in spreading factor (SF) pathways for uplink transmission, where SF is more than one"

The parties dispute whether or not "in parallel" should be changed to "at the same time." Huawei also seeks to add "where SF is more than one" to the claim language. At the oral hearing,

Huawei acknowledged that the distinction Huawei sought to establish was not so much that processing occurs "at the same time," but rather that "parallel pathways" is distinct from serially using one pathway repeatedly.

Positions of the Parties

As to the "in parallel" dispute, Nokia contends that processing "in parallel" refers to the well-understood concept of processing along multiple paths rather than along a single path, whether or not at the same time or not. Nokia contends that the specification states: "Fig. 3 further exhibits five parallel processing pathways ... [e]ach processing pathway ... operates similarly…." '718 Patent 4:51-55. Nokia contends that nothing in the specification suggests "at the same time." Nokia contends that the specification shows multiple embodiments of "processing in parallel," and the embodiments all refer to multiple processing pathways. (Dkt. No. 69 (citing '718 Patent 4:51-55, 7:5-11, Figs. 2-4).) Nokia also contends that the file history uses the term in a similar manner: "the group of modulated symbols are processed in parallel with each other in each of more than one pathway" and "in accordance with the exemplary embodiments as claimed in claim 1 each pathway processes a group of modulated data symbols where the processing involves a cyclically shifting of the group of modulated data symbols." (Dkt. No. 69 at 7 (citing Dkt. No. 69-3 at 8, 13).)

Nokia contends that Huawei's "same time" limitation contradicts the specification. Specifically, Nokia contends that the specification teaches an embodiment in which symbols generated from the parallel pathways are "consecutive." Nokia states that this is found in the passage "it is different data symbols that originate from different cells which might possibly interfere with each other in consecutive DFT-S-OFDMA symbols." '718 Patent 6:31-34. Nokia also states that the "consecutive" concept is described in "avoid[s] interference among

multiple/consecutive OFDMA symbols." Nokia states that this last passage indicates that the parallel processing is designed to avoid interference for symbols that occur one after the other. (Dkt. No. 69 at 7-8 (citing '718 Patent 6:36-37).) Nokia contends that the specification explains that not processing the symbols at the same time has the advantage that "[e]ven if the PUCCH transmission timing were such that identically shifted DFT-S-OFDMA symbols from UEs in different cells interfere with each other, the interference would be limited to only one DFT-S-OFDMA symbol" '718 Patent 6:17-22. Nokia contends that if different symbols were processed at the same time, the interference would not be limited to only one symbol and any overlap in the group of symbols would cause interference. (Dkt. No. 69 at 8.) Finally, Nokia contends that the cited references provide examples of parallel pathways that process symbols at different times according to an x-axis which is time. (*Id.*) Nokia contends that, thus, one skilled in the art would understand that in '718 Patent Figure 3, the x-axis is time, and therefore the parallel processing pathways are not processing at the same time. (*Id.*)

As to the second dispute, Nokia contends that by including "where SF is more than one," Huawei is importing a limitation from dependent claims 2 and 11 into independent claims 1 and 10. Further, Nokia contends that the specification describes this limitation as an optional embodiment: "following optional actions or elements may also be performed ... [and] each of said SF and N are characterized by integers greater than one." '718 Patent 9:27-38. Nokia contends that Huawei is not construing any particular word, but rather, seeking to import a limitation. (*Id.* a 9.)

Huawei contends that its "same time" position is supported by the file history because Nokia explained the addition of "parallel" in the claim in an Office Action Response that stated "symbols are processed in parallel with each other in each of more than one pathway." (Dkt. No. 72 (citing Dkt. No. 72-2 at 8).) As to Figure 3, Huawei states that no figure in the '718 Patent uses

time as an x-axis. Huawei further states that there is nothing that teaches any delay circuitry that would cause each pathway to be offset from the other in time. (Dkt. No. 72 at 4.) Huawei states that one skilled in the art would understand from the figure that the signals are processed at the same time. (*Id*. (citing Dkt. No. 72-1 (Akl Decl.) at ¶¶ 35-37).)

Huawei contends that the purpose of "processing in parallel" is to form the PUCCH (physical uplink control channel) transmission frame 314 without delay. (*Id*. (citing Dkt. No. 72-1 (Akl Decl.) at ¶ 38).) Huawei contends that the patent distinguishes between the parallel processing illustrated in Figure 3 and an alternative embodiment with serial processing. Specifically, Huawei points to the passage: "Similar holds true if the cyclic shifts were to be imposed prior to the FFT block 304 of FIG. 3 (though FFT processing per pathway A through E may be preferable in that case so as to form the transmission frame without delay from serial processing the multiple shifts through one FFT block)." '718 Patent 6:43-47. Huawei states that parallel processing is desirable because it allows the UE to form the transmission frame without delay.

As to Nokia's contention that the specification teaches "consecutive," Huawei contends that the citations in question relate to interference affecting consecutive symbols in transmissions from different cells, not the timing of the parallel pathways. (Dkt. No. 72 at 6.) Specifically, Huawei compares "if there are same data symbols originating from UEs in different cells, they would interfere with each other in every DFT-S-OFDMA symbol" ('718 pat. 6:23-28), with "this invention shifts data symbols cyclically" such that "it is different data symbols that originate from different cells which might possibly interfere with each other in consecutive DFT-S-OFDMA symbols" ('718 pat. 6:28-37).

Huawei also contends that its construction is consistent with the ordinary meaning. Huawei points to three technical dictionaries (IEEE, McGraw-Hill, and Microsoft) as teaching that the term includes the concept of "simultaneous." (Dkt. No. 72 at 5.)

At the oral hearing, Huawei acknowledged that the distinction Huawei sought to establish was not so much that processing occurs "at the same time," but rather that "parallel pathways" is distinct from serially using one pathway repeatedly. (Dkt. No. 85 at 5-8.) Thus, Huawei acknowledged that parallel processing did not necessarily require all activities to operate "at the same time." (*Id*. at 6-8.) Huawei expressed concern that Nokia's use of "plain and ordinary meaning" was provided so as to avoid the "parallel" limitation of the claim in a manner in which Nokia intended to argue that the construction included the use of one pathway multiple times serially. (*Id*. at 5-8.) Huawei emphasized that "parallel" connotes a meaning of multiple pathways that can operate separately. (*Id*. at 6-7.) Huawei stated that though perhaps not "at the same time," there should be some capability to operate concurrently. (*Id*. at 8.)

As to "SF is more than one," Huawei contends that dependent claims 2 and 11 have additional limitations beyond "SF is more than one," and thus, Huawei's construction would not merely result in the independent claims 1 and 10 having the same scope as claims 2 and 11. Huawei also states that the Office Action Response passage quoted above ("symbols are processed in parallel with each other in each of more than one pathway") requires SF to be greater than one. (Dkt. No. 72 at 5-6 (citing 72-2 at 8).)

In reply, Nokia contends that Huawei incorrectly interprets Figure 3 as "depict[ing] ... a single wire with parallel connections to each pathway." (Dkt. No. 73 at 1.) Nokia contends, in contrast, that a person of ordinary skill would understand Figure 3 as showing a functional block diagram, not a physical diagram. (*Id*. (citing Dkt. No. 73-1 (Acampora Decl.) at ¶28).) Nokia notes

that the specification merely states "FIG. 3 is a block level diagram of functional blocks" '718 Patent at 4:38-39. Nokia also contends that the claimed parallel processing could be performed in a sequence because Figure 3 occurs over a timeslot. Specifically, Nokia contends that in reference to Figure 3, "RSs 311, 313 are interspersed among the DFT-S-OFDMA symbols according to a predetermined pattern to form the whole timeslot of PUCCH 314." '718 Patent at 5:48-49. Nokia contends, that in other words, the x axis of Figure 3 is time. (Dkt No. 73 at 2 (citing Dkt. No. 73-1 (Acampora Decl.) at ¶30-31).)

Nokia contends that Figure 5 shows an example how a person of skill in the art could implement functional block diagrams of Figure 3 in user equipment ("UE") 10. Nokia contends that the UE shown in Figure 5 contains a single data processor 10A with a program stored in memory. Nokia contends that because there is a single data processor, the processor would likely have to process the parallel pathways in sequence, e.g., path A, then path B, then path C, then path D, then path E. (Dkt. No. 73 at 2 (citing Dkt. No. 73-1 (Acampora Decl.) at ¶29).) Nokia contends Huawei's construction would exclude this embodiment. Nokia contends that a person of ordinary skill would understand that processing in parallel may occur at the same time, but is not required to. (*Id*. (citing Dkt. No. 73-1 (Acampora Decl.) at ¶33).) Nokia contends that instead of referring to a time requirement, "in parallel" refers to multiple pathways.

Nokia contends that the '718 Patent's single reference to serial processing (referenced by Huawei) does not stand for the proposition that parallel processing requires processing at the same time. Nokia contends that at best, it stands for the proposition that parallel processing ***may*** occur at the same time. (Dkt. No. 73 at 2-3.). Nokia contends that it is possible to achieve the functionality of parallel pathways even if the processing associated with each of the pathways is temporally performed in a sequential fashion. (*Id*.)

As to Huawei's argument that the word "consecutive" describes transmission rather than processing, Nokia contends that the '718 Patent uses "consecutive" in the context of Figure 3, which describes processing (i.e., forming the transmission symbols) (Dkt. No. 73 at 3.) Nokia states that even if Huawei were correct that "consecutive" refers to a delay in transmission of symbols, this also supports Nokia's position that the processing need not be performed at the same time. Specifically, Nokia contends that if the symbols are to be transmitted consecutively anyway, a person of ordinary skill would understand that the symbols could be processed either sequentially or at the same time with no effect on transmission. (Dkt. No. 73 at 3.)

As to the extrinsic evidence dictionaries, Nokia contends those references are not from the relevant art. Nokia notes that Huawei's expert "conclude[s] that the field of art is telecommunications" (Dkt. No. 72-1 (Akl Decl.) at ¶18) and that the "patents relate to cellular networks" (*id*. at ¶25). Nokia contends that none of the cited dictionaries are related to telecommunications or cellular networks. (Dkt. No. 73 at 3.) Further, Nokia contends that some of these definitions require multiple processors which is contrary to dependent claim 20 and the embodiment shown in Figure 5. (*Id*.)

As to "SF is more than one," Nokia does not dispute that there are multiple paths. (Dkt. No. 73 at 3.) Nokia does dispute Huawei's attempts to alter the claims to require either (i) processing at the same time or (ii) only multiple ***physical*** paths. Nokia contends that processing in parallel refers to the well-understood concept of processing along multiple paths, either logical or physical. (*Id*. at 3-4 (citing Dkt. No. 73-1 (Acampora Decl.) at ¶¶25-31, 34, 44).) Nokia contends that a person of skill in the art would understand that the claimed parallel processing could be performed logically in parallel with no temporal limitation as shown in Figure 3, e.g., path A, then path B, then path C, then path D, then path E.

Analysis

As to the "at the same time" dispute, Huawei has not pointed to evidence mandating the inclusion of that limitation into the concept of parallel pathways. Moreover, Huawei has not pointed to evidence that even the disclosed embodiment operates "at the same time." The file history statement relied upon by Huawei does little more than require parallel pathways. There is no mandate of "at the same time." (*See* Dkt. No. 72-2 at 8.) As to the delay concept which Huawei points to at '718 Patent 6:43-47, the passage merely states that the processing in the pathways "may be preferable" to be performed "without delay from serial processing." *Id*. at 6:43-47. Rather than supporting Huawei's "at the same time" position, such passage at most merely distinguishes between serial processing and parallel processing. Further, the outputs of the pathways are not described with regard to outputs that are required to be provided simultaneously. Rather the outputs (Data 312A, 312B, 312C, etc.) are merely described as being placed in the timeslot of PUCCH 314 with reference symbols (RS) placed between the data:

> Eventually, from pathway A is generated an DFT-S-OFDMA symbol 312A. Similar such DFT-S-OFDMA symbols 312B, 312C, 312D, 312E are generated from the other respective processing lines. RSs 311, 313 are interspersed among the DFT-S-OFDMA symbols according to a pre-determined pattern to form the whole timeslot of PUCCH 314.

Id. at 5:43-49. This is shown in the figure:

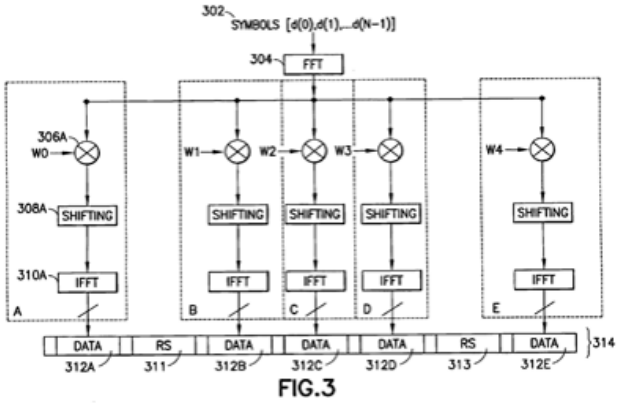


FIG.3

Such a teaching does not mandate the data be provided at the same time, rather as taught, the data is merely placed "according to a pre-determined pattern to form the whole timeslot of PUCCH 314." *Id*. Though not explictly stating that "parallel" need not be limited to "at the same time," Huawei's oral hearing argument implictily acknowledged such. (*See* Dkt. No. 85 at 5-8.)

Having rejected Huawei's "at the same time limitation," the Court notes that at the oral hearing it became clear that Nokia intends to interpret the term in a manner that ignores both the explicit "parallel" and "pathways" (plural) elements of the term. Nokia, in effect, argued that processing signals through the same pathway multiple times in serial was "functionally" parallel processing in multiple pathways. (*See* Dkt. No. 85 at 13-17, 21-22.) Nokia has pointed to no intrinsic evidence that supports this position. When the Court asked Nokia as to why serial processing in the same pathway multiple times was the ordinary meaning of "parallel processing," Nokia did not provide evidence that indicates "parallel" means in the ordinary meaning to include "serial." Further, as to the context of the specification itself, Nokia merely repeatedly relied on an argument that Figure 3 was only meant to provide a functional description of the claimed concept. However, even if only a functional description, the figure still illustrates multiple parallel pathways

for the functionality. Further, to the extent the figures are described as illustrating the "functions," it is still noted that:

> FIG. 3 is ***a block level diagram of circuitry*** for block-spreading DFT-S-OFDM with a spreading factor of five according to an exemplary embodiment of the invention which cyclically shifts in time.
>
> FIG. 4 is ***a block level diagram of circuitry*** for block-spreading DFT-S-OFDM with a spreading factor of five according to an exemplary embodiment of the invention which cyclically shifts in frequency response.

'718 Patent 3:42-49 (emphasis added). Thus, though the individual blocks may be merely illustrated functionally, the figures still provide guidance and context to the meaning of "multiple pathways."

Thus, the specification provides an example of multiple pathways, each operating with different spreading factors and with shifts. '718 Patent Figures 3-4 and associated text. As shown and described, the pathways would be in parallel whether operating on symbols at the same time or differing times. Further, the specification provides explicit distinctions between serial and parallel processing.

The specification also describes an embodiment of Figure 3 in which the shifting is done prior to the FFT block 304. *Id*. at 6:38-47. In such case, changing the circuitry to an FFT block per pathway is described as being advantageous, because the single FFT block approach, ***which is explicitly described as a "serial processing,"*** could result in delays. *Id*. Such a teaching explicitly contemplates that serial processing, even if "functional," is not the same as parallel processing. Finally, the Court also rejects Nokia's arguments that because Figure 5 illustrates only a single data processor 10A, "parallel" processing must include "serial" processing. That a single data

processor 10A is disclosed does not mean that such processor cannot have multiple circuitry pathways or processing pathways such that "parallel" must be redefined to mean "serial."[4]

As to the spreading factor (SF) value, Huawei merely points to the file history passage. However, as noted above, the passage merely references more than one pathway. The passage does not state that more than one spreading factor need be used. (Dkt. No. 72-2 at 8.) Further, elsewhere the claim provides the description of SF: "SF is equal to a number of elements in a spreading code." '718 Patent Claims 1 and 10.

By rejecting Huawei's "same time" and "SF is more than one" limitations and rejecting Nokia's contention that processing serially through a pathway multiple times is "parallel processing," the Court has resolved the claim construction dispute. *See O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) ("district courts are not (and should not be) required to construe every limitation present in a patent's asserted claims."); *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1207 (Fed. Cir. 2010) ("Unlike O2 Micro, where the court failed to resolve the parties' quarrel, the district court rejected Defendants' construction.").

The Court construes the terms "processing, by a user equipment, in parallel a group of N modulated symbols in spreading factor (SF) pathways for uplink transmission" / "process in parallel a group of N modulated symbols in spreading factor (SF) pathways for uplink transmission" to have their plain and ordinary meaning.

2. "cell-specific shift pattern" ('718 Patent Claims 1, 2, 7, 8, 10, 11, 16, 17, 19)

[4] The specification teaches that DP10 may include "one or more of general purpose computers, special purpose computers, microprocessors, digital signal processors (DSPs) and processors based on a multicore processor architecture, as non-limiting examples." '718 Patent 9:2-7.

Nokia's Proposed Construction	Huawei's Proposed Construction
Plain and ordinary meaning[5]	"shift pattern of a cell that is not identical to any adjacent cell"

The parties dispute whether two or more adjacent cells must have shift patterns that are not identical.

Position of the Parties

Nokia contends that according to the specification, a cell-specific shift pattern may be associated with, dependent on, or based on the current cell, but it is not required to be unique from any adjacent cell. (Dkt No. 69 at 15.) Nokia contends that Huawei improperly limits the term to an exemplary embodiment, excluding other preferred embodiments. Specifically, Nokia contends that the term is meant to cover pseudorandom patterns utilized in LTE Release 8/Release 9, which does not require a cell's shift pattern to be non-identical to an adjacent cell: "a pre-determined and pseudo-random shifting pattern that is specific for a cell" ('718 Patent 4:20-21), "according to a cell specific pseudo-random shifting pattern" (*id*. at 6:30-31), "pseudorandom sequence based on the cell index and system frame or slot number" (*id.* at 7:22-23), "cell-specific shift pattern is based on at least one of a cell index, a system frame number and a system slot number" (*id*. at 9:58-60), "the same shifting sequence ... is configured for those cells under coordinated usage" (*id*. at 7:37-39), and "LTE Release 8/Release 9 cyclic shift hopping pattern defined for PUCCH is applied as the shifting pattern" (*id*. at 7:43-44). Nokia contends that this teaches that the patentee intended to cover a pattern that could be identical to an adjacent cell. (Dkt No. 69 at 16.)

Nokia also contends that the usage of "cell-specific shift pattern" in the 3GPP standards meetings provides extrinsic evidence that this term was commonly understood in a manner

[5] At the oral hearing, Nokia agreed to the Court's proposal of "differing shift patterns are provided among differing cells." (Dkt. No. 85 at 22-23.)

consistent with the usage in the '718 Patent. Specifically, Nokia points to "[t]he shifting pattern varies ... according to a cell specific pseudorandom pattern" and "that Rel-8/9 cyclic shift hopping pattern defined for PUCCH Format 2 can be utilized as the shifting pattern" (Dkt. No. 69 at 17 (quoting Dkt. No. 69-6 (R1-104429) at 2).)

Huawei contends that the '718 patent explains that "upon attaching to a new cell after a handover, [the UE] automatically replac[es] the cell-specific shift pattern with a new shift pattern that is specific to the new cell." '718 Patent 9:58-64, Figure 6 (blocks 620, 622). Thus, an "adjacent cell will have its own cell-specific shifting pattern s1 that is not identical to [the shift pattern to which the UE is currently attached] s0." *Id*. at 5:57-59. Huawei also references a portion of the file history in which the applicant pointed to the passage at 5:57-59 as providing support for an amendment which included "cell-specific shift pattern." (Dkt. No. 72-3 at 9-10.) Huawei contends that the claims further reflect this, as claim 1 requires "a cell-specific shift pattern" and dependent claim 8 requires "upon attaching to a new cell after a handover, automatically replacing the cell-specific shift pattern with a new shift pattern that is specific to the new cell." Huawei also notes that the background of the '718 Patent describes how "transmissions from one UE operating for example at an edge of a first cell might regularly interfere with transmissions from another UE operating in an adjacent cell and using the same block spreading code." '718 Patent 2:45-49. Huawei contends that to solve the interference problem caused by a "UE operating simultaneously in an adjacent cell which happens to be assigned the exact same spreading code," the patent employs a "cell-specific" shifting pattern "so the adjacent cell will have its own cell-specific shifting pattern [] that is not identical." (Dkt. No. 72 at 8 (citing '718 Patent 5:50-59, 6:3-10 (under these circumstances, symbols transmitted by UEs in the adjacent cell will "differ[]").) Huawei contends that the use of the words "not identical" indicates that the "cell-specific" nature of the

"cell-specific shift pattern" is the fundamental aspect of the term. This aspect imposes "a level of randomization . . . on transmissions by UEs operating in different cells so as to mitigate co-channel interference among UEs which might be assigned the same spreading code." '718 Patent 6:11-16.

Huawei contends that Nokia's construction permits a shift pattern to be shared between two (or even more) adjacent cells and that this would contravene the point of the patent. Huawei also contends that its construction does not limit the term to a single exemplary embodiment from the specification, while excluding other preferred embodiments. Rather, Huawei contends that the '718 Patent does not disclose any "preferred embodiments" where the shift pattern of a cell is identical to an adjacent cell. (Dkt. No. 72 at 9.) Huawei also states that Huawei's construction does not preclude multiple cells in a network from using an identical shift pattern as long as this usage is coordinated to ensure that the shift pattern of a cell "is not identical to any adjacent cell." (*Id*. (citing '718 Patent 7:33-39 and Dkt. No. 72-1 (Akl Decl.) at ¶40-43).)

In reply, Nokia contends that the '718 patent states "[a]djacent eNBs may coordinate their use" and that "[i]n some embodiments the coordinated usage of block spreading codes can be realized in such a way that the same shifting sequence (and the same block spreading code) is configured for those cells under coordinated usage." '718 Patent 7:26, 7:36-39). Nokia cites to its expert to contend that, based on this teaching, a person of ordinary skill would understand that the plain meaning of cell-specific could include the scenario where the pattern is identical to an adjacent cell. (Dkt. No. 73 at 6 (citing Dkt. No. 73-1 (Acampora Decl.) at ¶73).) Nokia contends that one skilled in the art would understand that the disclosure of "pseudorandom" and "LTE Release 8/Release 9 cyclic shift hopping pattern" indicates that a pattern could be unique from an

adjacent cell but is not required to be. (*Id*. at 6-7 (citing Dkt. No. 73-1 (Acampora Decl.) at ¶70-76).)

Analysis

The parties dispute whether cell-specific shift patterns require the shift patterns between adjacent cells to be "not identical." Huawei points to one passage in the specification in which the shifting pattern is described as cell-specific "so the adjacent cell will have its own cell-specific shifting pattern s1 that is not identical to s0." '718 Patent 5:57-59. That is the only reference to the cell-specific pattern resulting in a pattern that is not "identical" to any adjacent cell.[6] Nokia contends that the specification provides examples that one skilled in the art would understand to include patterns that are, at times, identical to adjacent cells. Specifically, Nokia points to the repeated specification references to the patterns being pseudorandom sequences. Huawei only provides attorney argument to contend that such teachings would not include identical shift patterns. (Dkt. No. 72 at 9.) Nokia's expert states that with regard to pseudorandom sequences:

> the reality is that two different pseudorandom sequences may produce identical patterns for an extended period of time. Although two different pseudorandom generators will generate different patterns over the entire length of the sequences, segments of these patterns over some smaller time interval may be the same. Accordingly, at any given time, the shift pattern of adjacent cells may be the same, although they may not be the same at some other time.

(Dkt. No. 73-1 (Acampora Decl.) at ¶71.) Huawei's expert does not reference the pseudorandom teachings of the specification. Further, the specification actually notes that "identically shifted" symbols from UEs in different cells may exist but such interference would be limited to one symbol

[6] The portion of the file history cited by Huawei that also references this specification passage merely stands for the proposition of support being found in the specification for the added limitation as a whole, not that "cell-specific" requires that shifting patterns must not be identical to any adjacent cell. (*See* Dkt. No. 72-3 at 9-10.)

as randomization may disrupt patterns from repeating. '718 Patent 6:17-22. This provides further evidence that shifting patterns of adjacent cells may, at times, be identical.

As to the disclosure of "coordination" between cells, Huawei does not point to intrinsic evidence that discusses the "identical" concept with regard to coordination. Moreover, Huawei's expert merely states, somewhat circularly, that Huawei's construction does not preclude coordination as long as the coordination is designed to ensure shift patterns of adjacent cells are not identical. (Dkt. No. 72-1 (Akl Decl.) at ¶43.) In contrast, the specification explicitly states that "adjacent eNBs may coordinate their use of UE-specific block spreading codes in a predetermined manner" ('718 Patent 7:26-27) and:

> In some embodiments the coordinated usage of block spreading codes can be realized in such a way that the same shifting sequence (and the same block spreading code) is configured for those cells under coordinated usage.

Id. at 7:36-39. Such a teaching implies that in some circumstances, the same shifting sequence may be utilized in adjacent cells. Nokia provides expert evidence that such language would teach a person of ordinary skill in the art that the shifting patterns may include the identical shift sequence between adjacent cells. (Dkt. No. 73-1 (Acampora Decl.) at ¶73.)

Based upon the intrinsic evidence and the extrinsic evidence regarding how a person of ordinary skill in the art would understand the examples in the specification, the Court rejects Huawei's importation of "identical" into the claim. *See Phillips*, 415 F.3d 1303; *Teva Pharm. USA*, 135 S. Ct. 831. As to Huawei's argument that the plain and ordinary meaning would encompass all cells having the same shift pattern, the Court does not find that the intrinsic and extrinsic evidence provides such a meaning. Further, Nokia has not advocated such a position. (*See* Dkt. No. 69 at 15.) In context of the specification, the patterns would be based upon the cell in a

manner that provides differing shift patterns for differing cells. The specification does not mandate, however, that these patterns can never by identical.

The Court construes the term "cell-specific shift pattern" to mean "differing shift patterns are provided among differing cells."

3. "means for processing in parallel a group of N modulation symbols in spreading factor (SF) pathways for uplink transmission, wherein N and SF are integers and SF is equal to a number of elements in a spreading code" ('718 Patent Claim 19)

Nokia's Proposed Construction	Huawei's Proposed Construction
Function: processing in parallel a group of N modulation symbols in spreading factor (SF) pathways for uplink transmission, wherein N and SF are integers and SF is equal to a number of elements in a spreading code Structure: as shown in Figures 3, 4, and UE 10 in Figure 5, a processor; or processor, memory, and/or associated software; and/or receiver, transmitter, or transceiver; and equivalents thereof	Function: processing a group of N modulated[7] symbols at the same time in spreading factor (SF) pathways for uplink transmission, where SF is more than one, and wherein N and SF are integers and SF is equal to a number of elements in a spreading code Structure: data processor 10A[8]

The parties dispute both the function and structure. The function dispute is the same as presented above with regard to "parallel" and "SF is more than one." As to the function, both parties rely on the same arguments as discussed above with regard to claims 1 and 10. As to the structure, the parties dispute whether the structure should be limited to a data processor.

Positions of the Parties

Nokia contends that the '718 Patent discloses numerous structures for "processing in parallel." Nokia contends that one such structure is the UE 10 of Figure 5. Nokia points to the

[7] Huawei contends that "modulated" and "modulation" symbols are equivalent and that Huawei proposes "modulated" for consistency with claims 1 and 10.

[8] Unlike other means terms for which Huawei asserted a processor was the corresponding structure, here Huawei has not contended that an algorithm is required. (Dkt. No. 74-1 at 1.)

language "Fig. 5 shows a simplified block diagram of various electronic devices that are suitable for use in practicing the exemplary embodiments of this invention." '718 Patent 3:50-52, 7:60-8:5. Nokia states that the UE in Figure. 5 "includes a controller, such as a computer or a data processor (DP) 10A, a computer-readable memory medium embodied as a memory (MEM) 10B that stores a program of computer instructions (PROG) 10C, and a suitable radio frequency (RF) transmitter and receiver 10D for bidirectional wireless communications" *Id.* at 8:6-11. Nokia also contends that the specification identifies numerous types of memory structures and processor structures. (Dkt. No. 69 at 10 (citing '718 Patent 8:63-9:7).) Further, Nokia contends that the specification also states "firmware or software which may be executed by a controller, microprocessor or other computing device, although the invention is not limited thereto." '718 Patent 10:4-11, 8:27-49; 9:65-10:3; 10:12-32. Nokia states that data processor 10A is but one of many structures disclosed in the specification, and there is no evidence to suggest that the meaning of this term should be constrained to this one example.

Huawei contends that the only disclosed structure is data processor 10A. As to "transceiver," Huawei contends that the term does not even appear in the patent. Further, as to the receiver and transmitter, Huawei contends those structures are described in the specification as performing a different function, "bidirectional wireless communications with the eNB 12," and the structures do not independently perform the claimed "processing means." '718 Patent 8:6-12.

Analysis

The dispute, as to the functional language, centers on the meaning of "processing in parallel" and "spreading factor (SF) pathways." The arguments presented by the parties are the same as discussed above with regard to the usage of "parallel" in claims 1 and 10. The rationale of the Court presented above applies here also. Processing in parallel does not mandate the "same

time" and SF is not required to be "more than one." However, as noted above, processing in parallel is distinct from serially processing multiple times.

As to the structure, a "structure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim." *Medtronic*, 248 F.3d at 1311. The focus of the "corresponding structure" inquiry is not merely whether a structure is capable of performing the recited function, but rather whether the corresponding structure is "clearly linked or associated with the [recited] function." *Id*. Though Huawei is correct that the '718 Patent discloses data processor 10A, the '718 Patent specification provides additional disclosure of structure performing the claimed function. For example, the specification teaches "a controller, such as a computer or a data processor (DP) 10A, a computer-readable memory medium embodied as a memory (MEM) 10B that stores a program of computer instructions (PROG) 10C…." '718 Patent 8:6-11. Elsewhere, the specification references "DPs 10A and 12A may be any type of suitable to the local technical environment, and may include one or more general purpose computers, special purpose computers, microprocessors, digital signal processors (DSPs) and processors based on multicore processor architecture, as non-limiting examples." *Id*. at 9:2-7. Elsewhere, the patent references implementing the disclosed embodiments in a "controller, microprocessor or other computing device, although the invention is not limited thereto." *Id*. at 10:4-11. Further, Figures 3 and 4 provide specific structures that process in parallel the symbols, as designated by the structures of parallel pathways A, B, C, D, and E. As described, Figures 3 and 4 provide block diagrams of circuitry for applying the spreading factors in parallel pathways. *Id*. at 3:42-49, 4:51-64, 7:3-11, Figure 3, Figure 4. The figures and specification disclose the processing accomplished with multipliers 306 and shifters 308 / 408.

Nokia seeks to further include "receiver, transmitter, or transceiver" within its construction. Generally, such structure is described as "the RF transmitter and receiver 12D [are] for communication with the UE 10 via one or more antennas." *Id*. at 8:16-17. Elsewhere, however, the specification does describe that processing may be done in either the baseband frequency, in which case processing is performed in DP 10A, or that processing may be done at the RF frequency, in which case processing is done in the transmitter and receiver 10D. *Id*. at 8:40-47. In either case, the more general disclosure of the specification describes controllers or processors as identified above. The Court's construction adopted below does not exclude either embodiment as to where the processor or controller is located. At the oral hearing, Nokia agreed to the Court's construction presented below. (Dkt. No. 85 at 32-33.) Huawei agreed to the construction to the extent it includes the circuitry of the parallel pathways but disagreed to the inclusion of "processor" being listed with the conjunction "or." (*Id*. at 33-34.) Huawei indicated the construction would be agreeable if the references to "controller or processor" were deleted from the structure.[9] (*Id*. at 34.)

The Court construes "means for processing in parallel a group of N modulation symbols in spreading factor (SF) pathways for uplink transmission, wherein N and SF are integers and SF is equal to a number of elements in a spreading code" to mean:

<u>Function</u>: processing in parallel a group of N modulation symbols in spreading factor (SF) pathways for uplink transmission, wherein N and SF are integers and SF is equal to a number of elements in a spreading code.

[9] Huawei did not elaborate on why "processor" was objectionable structure when Huawei's own construction was "data processor 10A," particularly in light of the broad disclosure of data processor 10A found at '718 Patent 9:1-7.

Structure: a controller or processor; a controller or processor, memory, and/or associated software; or circuitry of parallel pathways A, B, C, D, and E of Figures 3 and 4, including multipliers and shifters in each pathway, such as multiplier 306A and shifter 308A in pathway A of Figure 3 and multiplier (unlabeled) and shifter 408A of pathway A of Figure 4; and equivalents thereof.

4. **"means for multiplying in parallel each of the N modulated symbols in each of the SF pathways with a unique element of the spreading code and outputting N symbols in each of the SF pathways" ('718 Patent Claim 19)**

Nokia's Proposed Construction	Huawei's Proposed Construction
Function: multiplying in parallel each of the N modulated symbols in each of the SF pathways with a unique element of the spreading code and outputting N symbols in each of the SF pathways Structure: processor; or processor, memory, and/or associated software; and/or one or more multipliers 306A; and equivalents thereof	Function: multiplying each of the N modulated symbols at the same time in each of the SF pathways with a unique element of the spreading code and outputting N symbols in each of the SF pathways Structure: multipliers in each of the SF pathways, such as 306A for pathway A

The parties dispute both the function and structure. The function dispute is the same as presented above with regard to "parallel" and "SF is more than one." As to the function, both parties rely on the same arguments as discussed above with regard to claims 1 and 10. As to the structure, the parties dispute whether the structure should be limited to just the multipliers or more generally include the processor.

Positions of the Parties

Nokia contends that the '718 Patent discloses numerous structures for "multiplying in parallel," including a processor, memory, and/or associated software (Dkt. No. 69 at 11 (citing '718 Patent 3:50-52; 7:60-8:11; 8:27-49; 8:63-9:7; 9:65-10:32; Figure 5).) Nokia states that the

’718 Patent also discloses “a multiplier 306A to multiply the frequency domain group of modulation symbols.” ’718 Patent 4:60-61; Figure 3. Nokia contends that Huawei seeks to limit the structure to only the multiplier exemplary embodiment. Nokia contends that under 35 U.S.C. § 112 ¶ 6, a term is entitled to all of the structures disclosed in the ’718 patent.

Huawei contends that the corresponding structure is performed by computer software. (Dkt. No. 72 at 12.) Huawei contends that the only structures disclosed in the patent for the “multiplying means” term are the multipliers in each of the SF pathways, such as 306A for pathway A. (*Id*. (citing ’718 pat. 4:51-64 (“[p]athway A uses a multiplier 306A to multiply the frequency domain group of modulation symbols . . . by spreading element w0”), 6:38-47 (“multiplier blocks” are for “multiplying [symbols with] the relevant element of the spreading code w”), Figure 3; 2:30-39, Figs. 2, 4).). Huawei contends that nothing in the patent ties the claimed “multiplying means” function to a generic processor, rather, to achieve the claimed function, the specification describes the use of “multipliers in each of the SF pathways.” (*Id*.)

In reply, Nokia contends that Huawei argues that the structure could not include a processor, despite the fact that dependent claim 20 makes clear that the structure may be a processor. (Dkt. No. 73 at 4 (citing ’718 Patent Claim 20 (“wherein the means for multiplying…comprise at least one computer program code embodied on at least one memory and executed by at least one processor”)).) Nokia contends that the ’718 Patent discloses numerous processor structures (’718 Patent at 9:2-7) and that the ’718 Patent clearly discloses an algorithm for the multiplying step (’718 Patent at 4:55-64).

Nokia contends that Huawei’s expert argues that a “single multiplier 306A would not be enough, because the claim requires that the multiplying be done” at the same time, which cannot be accomplished with one multiplier (Dkt. No. 73 at 5 (citing Dkt. No. 72-1 (Akl Decl.) at ¶46).)

Nokia states that this position contradicts Huawei's earlier construction of the "means for processing in parallel" being a single data processor, because a single data processor likely could not process five pathways at the same time. Nokia contends that this is further proof that "in parallel" cannot mean at the same time. Nokia states that a person of ordinary skill would understand the disclosed structure to include one or more multipliers, or a processor, because "in parallel" does not require that functions be performed at the same time. (Dkt. No. 73 at 5 (citing Dkt. No. 73-1(Acampora Decl.) at ¶¶50, 52-56).)

Analysis

The dispute as to the functional language centers on the meaning of "parallel." The arguments presented by the parties are the same as discussed above with regard to the usage of that concept in claims 1 and 10. The rationale of the Court presented above applies here also.

As to the structure, Huawei is correct that the specification discloses multipliers in each of the SF pathways, such as multiplier 306A in pathway A. However, the specification discloses more. Though in one place Figures 3 and 4 are described as "a block diagram of circuitry," elsewhere Figure 3 is described as "functional blocks" and Figure 4 is a "functional arrangement." '718 Patent 3:42-47, 4:38-39, 7:3-4. Further, Figure 5 is described as "an apparatus suitable for use in practicing the exemplary embodiments." *Id*. at 7:60-63. As discussed above, Figure 5 references "a controller, such as a computer or a data processor (DP) 10A, a computer-readable memory medium embodied as a memory (MEM) 10B that stores a program of computer instructions (PROG) 10C…." *Id*. at 8:6-11. Elsewhere, the patent references implementing the disclosed embodiments in a "controller, microprocessor or other computing device, although the invention is not limited thereto." *Id*. at 10:4-11. Further, the specification is clear that the functional blocks may be implemented in hardware or software in combination with hardware. *Id*. at 8:31-

35, 10:4-11. In light of specific disclosures, Huawei's construction, which limits the structure to only one of the disclosed embodiments, is improper. At the oral hearing Nokia objected to the Court's construction for not merely being limited to a processor. (Dkt. No. 85 at 40-41.) As to what structure is disclosed for the particular claimed function, it is noted that the function includes "multiplying in ***parallel*** each of the N modulated symbols in ***each of the SF pathways***" and "outputting N symbols in ***each of the SF pathways***." For this explicit function, the specification does not merely disclose a processor, but rather multipliers in each SF pathway are the corresponding structure. Thus, this concept is included in the Court's construction.

At the oral hearing, Huawei agreed to the construction presented below. (Dkt. No. 85 at 42-43.)

The Court construes "means for multiplying in parallel each of the N modulated symbols in each of the SF pathways with a unique element of the spreading code and outputting N symbols in each of the SF pathways" to mean:

<u>Function</u>: multiplying in parallel each of the N modulated symbols in each of the SF pathways with a unique element of the spreading code and outputting N symbols in each of the SF pathways.

<u>Structure</u>: (1) multipliers in each of the SF pathways, such as multiplier 306A for pathway A, (2) a controller or processor including multipliers in each SF pathway such as multiplier 306A for pathway A or (3) a controller or processor, memory, and/or associated software, including multipliers in each SF pathway such as multiplier 306A for pathway A; and equivalents thereof.

5. **"means for performing a cyclic shift to the output N symbols in each of the SF pathways, wherein each SF pathway is using a particular shift from a series of SF cyclic shifts, and wherein the series of cyclic shifts is according to a [cell-specific shift pattern]" ('718 Patent Claim 19)**

Nokia's Proposed Construction	Huawei's Proposed Construction
Function (Agreed): performing a cyclic shift to the output N symbols in each of the SF pathways, wherein each SF pathway is using a particular shift from a series of SF cyclic shifts, and wherein the series of cyclic shifts is according to a [cell-specific shift pattern] Structure: processor, memory, and/or associated software configured to perform the algorithm disclosed in the '718 patent at 4:65-6:10, 7:33-46, or block 620 of Fig. 6 and corresponding text; shifter 10E; and/or one or more shifters 308A or 408A; and equivalents thereof	Function (Agreed): performing a cyclic shift to the output N symbols in each of the SF pathways, wherein each SF pathway is using a particular shift from a series of SF cyclic shifts, and wherein the series of cyclic shifts is according to a [cell-specific shift pattern] Structure: Indefinite for failure to disclose structure

Huawei contends that no algorithm is disclosed that corresponds to the claimed function, and, thus, the structural disclosure of the specification is deficient.

Positions of the Parties

Nokia contends that the specification teaches the structure may be a processor, memory, and/or associated software. (Dkt. No. 69 at 12 (citing '718 Patent 3:50-52, 7:60-8:11, 8:27-49, 8:63-9:7, 9:65-10:32, Figure 5).) Nokia further contends that the '718 Patent also discloses "the cyclic shifter 10E/12E may operate to shift in time or shift frequency bins. The shifters 10E/12E may be implemented in the respective DP 10A/12A such as for the case where the relevant processing is done at baseband, or in the RF front end chip represented as the transmitter and receiver 10D/12D such as for the case where the relevant processing is done at RF, or they may be implemented in some other processor that is slaved to the timing of the DP 10A/12A." '718 8:36-49. Nokia further points to the statement that "cyclic shifting is done at shifter 308A." *Id*. at 4:63-

64, 5:25-31, 6:3-10, Figure. 3. Nokia additionally identifies "shifting block 408A" of Figure 4. *Id*. at 7:8-11, Figure 4.

Nokia contends that all of these structures would connote structure to one skilled in the art, and thus no algorithm need be disclosed. (Dkt. No. 69 at 13.) If an algorithm were needed, Nokia contends that the specification discloses multiple algorithms. Specifically, Nokia points to (1) "s0 gives the following shifting pattern: s0 shift 1: [d1, d2, d3, d4, d5, d0] ...," and then explains that the "shifting block 308A ... applies 'shift 1' and its input and output are as follows: ... Output of the shifting block 308A: [w0d1, w0d2, w0d3, w0d4, w0d5, w0d0]" ('718 Patent 4:65-6:10; (2) "LTE Release 8/Release 9 cyclic shift hopping pattern defined for PUCCH is applied as the shifting pattern" (*id*. at 7:42-46); (3) "the coordinated usage of block spreading codes ... in such a way that the same shifting sequence (and the same block spreading code) is configured for those cells under coordinated usage" (*id*. at 7:33-39); and (4) "cyclic shift pattern may be a pseudorandom sequence based on the cell index and system frame or slot number" (*id*. at Block 620 of Figure 6; 7:21-23). Nokia cites to the Acampora declaration to contend that a person skilled in the art would recognize the structure could be cyclic shifter 10E, shifter 308A, shifting block 408A, or a processor, memory and multiple algorithms. (Dkt. No. 73 at 5.) Huawei contends that the claim language is not merely "shifting" but rather a specific shift: "using a particular shift from a series of SF cyclic shifts" in each pathway, and that "the series of cyclic shifts is according to a cell-specific shift pattern." Huawei contends that the specification does not disclose an algorithm that performs all of the recited functions.

Huawei contends that there can be no argument that the specification teaches that the function is performed by a data processor. Specifically, Huawei states that the specification teaches that the cyclic shifter 10E of Figure 5 "may be implemented in the respective DP10A/12A." '718

Patent 8:43-44. Huawei states that the specification merely teaches that shifter 10E performs a shift. (Dkt. No. 72 at 14 (citing Dkt. No. 72-1 (Akl Decl.) at ¶¶48-50).) Huawei contends that there is no algorithm disclosed for (1) "performing a cyclic shift to the output N symbols in each of the SF pathways," (2) "using a particular shift from a series of SF cyclic shifts" in each pathway, and (3) ensuring that "the series of cyclic shifts is according to a cell-specific shift pattern." Huawei points to "using a particular shift from a series of SF cyclic shifts" as an example. Huawei states that the '718 patent specification provides a shift pattern "s0" that includes six shifts and states that "shifting block 308A . . . applies 'shift 1,'" with no indication of the steps that the system takes to determine that "shift 1" should be applied in that pathway. (Dkt. No. 72 at 14 (citing '718 pat. 4:65-5:31).) Huawei contends that the specification states that "the respective first five of the above six shifts are imposed by the respective shifting blocks at the respective five processing pathways A through E of FIG. 3," without explaining how the claimed "particular shift" is being selected from the series of cyclic shifts. (*Id*. (citing '718 pat. 5:22-25).) Huawei contends that specification simply states that the "shifting pattern s0 . . . is cell-specific, and so the adjacent cell will have its own cell-specific shifting pattern s1 that is not identical to s0," without explaining how that is done. (*Id*. (citing '718 pat. 6:28-37).) Huawei contends that such types of disclosure merely describe the function without explaining how the function is performed, and, thus, do not satisfy the algorithm requirement. (*Id*. at 15 (citing a variety of Federal Circuit cases).)

Analysis

Huawei contends that an algorithm must be disclosed. However, the corresponding structure described in the patent specification must include an algorithm for performing the function for a programmed general purpose computer or microprocessor. *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999). The specification does describe that the

functionality may be accomplished by general purpose computers. ’718 Patent 9:2-7, 10:14-19. However, the specification also discloses that the functionality may be additionally accomplished in specific circuitry or logic, special purpose computers, processors or controllers, transmitter and receiver, and hardware. *Id*. at 3:42-49, 8:34-45, 8:42-47, 9:2-7, 10:4-19, Figure 3, Figure 4. Such embodiments include shifter 308A, DFT shifter 408A, and cyclic shifter 10E. Thus, the specification provides embodiments of the structure that is not a programmed general purpose computer or microprocessor. Such embodiments do not require an algorithm. Further, to the extent an algorithm is required, as noted by Nokia, the specification provides extensive details regarding algorithms including (1) “s0 gives the following shifting pattern: s0 shift 1: [d1, d2, d3, d4, d5, d0] ...,” and “shifting block 308A ... applies ‘shift 1’ and its input and output are as follows: ... Output of the shifting block 308A: [w0d1, w0d2, w0d3, w0d4, w0d5, w0d0]” (’718 Patent 4:65-6:10; (2) “LTE Release 8/Release 9 cyclic shift hopping pattern defined for PUCCH is applied as the shifting pattern” (*id*. at 7:42-46); (3) “the coordinated usage of block spreading codes ... in such a way that the same shifting sequence (and the same block spreading code) is configured for those cells under coordinated usage” (*id*. at 7:33-39); and (4) “cyclic shift pattern may be a pseudorandom sequence based on the cell index and system frame or slot number” (*id*. at Block 620 of Figure 6; 7:21-23). As explained in the specification, these techniques provide a cell-specific shift pattern. *Id*. at 4:18-26, 5:7-27, 5:50-59, 6:48-65, 7:16-23, 7:40-49. At the hearing, the Court proposed a structure similar to that adopted below except the Court’s proposal did not include “in each of the SF pathways” in the structure. Huawei agreed to that construction. (Dkt. No. 85 at 44.) The Court’s construction below further includes “in each of the SF pathways” within the structure because such language conforms to the structure that performs the claimed function which includes “in each of the SF pathways” in the functional language.

The Court construes "means for performing a cyclic shift to the output N symbols in each of the SF pathways, wherein each SF pathway is using a particular shift from a series of SF cyclic shifts, and wherein the series of cyclic shifts is according to a [cell-specific shift pattern]" to mean:

<u>Function</u>: performing a cyclic shift to the output N symbols in each of the SF pathways, wherein each SF pathway is using a particular shift from a series of SF cyclic shifts, and wherein the series of cyclic shifts is according to a [cell-specific shift pattern]

<u>Structure</u>: a controller or processor, memory, and/or associated software configured to perform the algorithm disclosed in the '718 patent at 4:65-6:10, 7:33-46, or block 620 of Figure 6 and corresponding text; a shifter 10E including shifters in each of the SF pathways; and/or one or more shifters 308A or 408A in each of the SF pathways; and equivalents thereof.

6. "determining that channel selection and constellation selection are in use or to be used" ('636 Patent Claim 1)

Nokia's Proposed Construction	Huawei's Proposed Construction
Plain and ordinary meaning	"determining using a processor that channel selection and constellation selection are in use or to be used"

The parties dispute whether or not "using a processor" should be inserted into the claim term.

<u>Positions of the Parties</u>

Nokia states that Huawei merely inserts "using a processor" into the claim language. Nokia contends that this conflicts with the examples in the specification by limiting the invention to just a processor. Nokia points to "apparatus 200 ***may*** also include at least one processor" ('636 Patent

9:25) (emphasis added); "the method of Fig. 1 may be implemented completely in hardware. Alternatively, a computer readable medium, such as a storage medium or non-transitory medium, can be encoded with instructions that, when executed in hardware, perform the method" (*id*. at 8:66-9:4); and "Fig. 2 illustrates an apparatus according to certain embodiments of the present invention. The apparatus 200 of Fig. 2 includes at least one memory 210, including computer program code 200" (*id*. at 9:8-11). Nokia states that a person of ordinary skill would also easily understand that a way of implementing the invention without a processor would be via a piece of digital logic using a hardware descriptive language that provides the channel selection and constellation selection functionality. (Dkt. No. 73 at 7 (citing 73-2 (Camp Decl.) at ¶¶19-24).) Further, Nokia argues claim differentiation indicates that Huawei's construction renders the usage of "at least one processor" in independent claim 8 superfluous.

Huawei contends that the claim does not explain how the function is performed. Huawei contends that Figure 1 illustrates a flowchart including the determining steps, and the specification then states that "the method of FIG. 1 may be implemented completely in hardware," or "a computer readable medium . . . can be encoded with instructions that, when executed in hardware, perform the method of FIG. 1." '636 Patent 8:65-9:4. Huawei notes that the hardware illustrated in Figure 2 includes "at least one processor 230." (Dkt. No. 72 at 16 (citing '636 Patent 9:9-30, Figure 2).) Huawei contends that in ten separate instances, the '636 patent teaches that "the at least one memory 210 and the computer program code 220 can be configured to, with the at least one processor 230, cause the apparatus 200 at least to" perform a function. '636 Patent 9:31-40 ("determine"), 9:41-46 ("communicate"), 9:47-51 ("combine"), 9:52-59 ("apply"), 9:60-67 ("switch off"), 10:1-7 ("select a channel"), 10:8-14 ("reserve"), 10:15-20 ("determine"), 10:21-27

("select channel and constellation point"), 10:28-33 ("spatial bundle"). (Dkt. No. 72 at 16.) Huawei contends that Nokia has not disclosed any embodiments that do not include a processor.

Analysis

As drafted, the claim is directed toward a method and the determining step does not recite specific structure. Huawei has not pointed to clear language in the intrinsic record of lexicography, disavowal, or disclaimer mandating that the determining operation is limited to operations performed by a processor. *See GE Lighting Solutions*, 750 F.3d at 1309; *Cordis Corp.*, 561 F.3d at 1329. Rather, Huawei merely points to an embodiment of the specification. However, even a single embodiment is not necessarily enough to read a limitation into the claim from the specification. *Arlington Indus., Inc. v. Bridgeport Fittings, Inc.*, 632 F.3d 1246, 1254 (Fed. Cir. 2011) ("[E]ven where a patent describes only a single embodiment, claims will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words of expressions of manifest exclusion or restriction.") (citation omitted).

Moreover, here the patent explicitly provides permissive language regarding the structure: "apparatus 200 ***may*** also include at least one processor." '636 Patent 9:25 (emphasis added). Further, the patent is clear that

> The method illustrated in FIG. 1 may be variously implemented. For example, the method of FIG. 1 may be implemented completely in hardware. Alternatively, a computer readable medium, such as a storage medium or non-transitory medium, can be encoded with instructions that, when executed in hardware, perform the method of FIG. 1, or some part of the method shown there. Other steps not illustrated in FIG. 1 may also be performed by the execution of the instructions. The method of FIG. 1 may be performed by a user equipment or by some other network element.

Id. at 8:65-7. Hardware implementations without the use of instructions are, therefore, contemplated ("the method of Fig. 1 may be implemented completely in hardware"). *Id*.

Alternatively, "a computer readable medium, such as a storage medium or non-transitory medium, can be encoded with instructions that, when executed in hardware, perform the method." *Id*. at 8:66-9:4. Thus, implementations such as Figure 2 show that a processor 230 combined with computer programs are contemplated: "Fig. 2 illustrates an apparatus according to certain embodiments of the present invention. The apparatus 200 of Fig. 2 includes at least one memory 210, including computer program code 220." *Id*. at 9:8-11. The embodiment of Figure 2 is not, however, "implemented completely in hardware" as is recited in other alternatives. In totality, the patent is clear that a particular structure, specifically a processor, is not mandated for the "determining" step.

The Court construes "determining that channel selection and constellation selection are in use or to be used" to have its plain and ordinary meaning.

7. "constellation selection" ('636 Patent Claims 1, 8, 15)

Nokia's Proposed Construction	Huawei's Proposed Construction
Plain and ordinary meaning	Indefinite

Huawei contends the claim term is indefinite, because the term is ambiguous as the term could mean the selection of a constellation scheme or the selection of constellation points.

Nokia

Nokia contends that the '636 Patent describes constellation selection with more than reasonable certainty. Nokia contends that in one embodiment, the specification teaches selecting constellation points: "[t]he method can further include communicating ... one to four bits by selecting at least one channel and the constellation point according to at least one pre-determined mapping table" ('636 Patent 8:18-21), "[t]he selected channel and the QPSK constellation point used can be determined based on the ACK/NACK/DTX states" (*id*. at 1:38-40), and "constellation

point selection among pre-configured physical uplink control channel format 1b resources takes place in the case where the user equipment receives a scheduling grant" (*id*. at 6:50-53). Nokia contends that the specification also provides specific examples of constellation scheme selection in the "Data Const." column of Tables 1-3 (*id*. at Tables 1-3), "[t]his is just one example, as it is possible to rotate the data constellations within the resource" (*id*. at 5:2-3; *see also id*. at 6:38-39), and "there are no problems with changing the constellation and channel selection entries" (*id*. at 6:39-40).

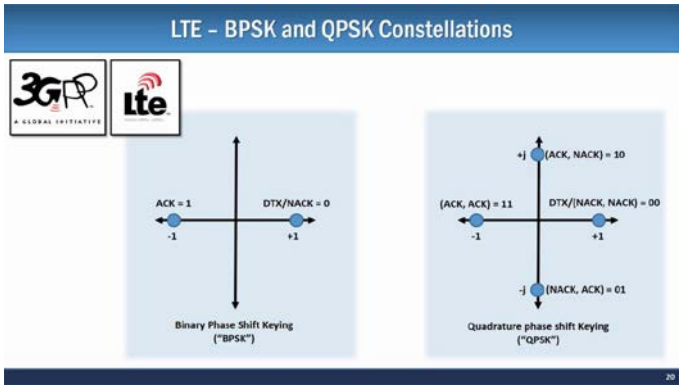
Nokia contends that this shows that a person of ordinary skill would understand selection of a constellation to include selection of constellation points or constellation schemes (such as QPSK) without needing to specially define the term any further. Nokia contends that the fact that the specification describes both concepts does not render the term indefinite because mere breadth does not render a term indefinite. (Dkt. No. 69 at 20 (citing *Mobile Telecomms. Techs., LLC v. Google Inc.*, No. 2:16-CV-2-JRG-RSP, 2016 WL 7338398, at *19 (E.D. Tex. Dec. 18, 2016)).)

Nokia also points to Huawei's expert's statement that "[a] person of ordinary skill would have understood selection of a constellation to include selection of constellation schemes ***or*** selection of constellation points" (Dkt. No. 73 at 7 (quoting Dkt. No. 72-1 (Akl Decl.) at ¶55).) Nokia contends that Huawei's expert then goes on to clearly define each embodiment (*Id*. (citing Dkt. No. 72-1 (Akl Decl.) at ¶¶59-60).) Nokia contends that it is illogical that a person of ordinary skill would understand each embodiment individually with complete certainty, but then lose all reasonable certainty of scope when considering both embodiments. Nokia contends that Huawei's expert states a "well-known method to represent PSK schemes was to do so on a constellation diagram" (Dkt. No. 72-1 (Akl Decl.) at ¶56) and "points on a constellation diagram are called constellation points" (*id*. at ¶60). Nokia contends that, thus, a person of ordinary skill clearly

understood the plain and ordinary meaning of selection of a constellation point and selection of a constellation scheme, and that the '636 Patent covers both. (Dkt. No. 73 at 8.)

Huawei contends that, as used, the term "does not provide clear notice of what is claimed, thereby apprising the public of what is still open to them." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). Huawei points to its expert declaration as establishing that one skilled in the art would not be reasonably certain as to the meaning of the term. (Dkt. No. 72 at 17 (citing Dkt. No. 72-1 (Akl Decl.) at ¶¶ 53-54).)

Huawei notes that the extrinsic evidence 3GPP standardization documents support this position, because none of the documents actually used "constellation selection." Rather, the documents used "constellation mapping" and "constellation points." Huawei contends that reciting "constellation mapping" schemes is different from selecting "constellation points." (Dkt. No. 72 at 17.) Huawei points to two constellation mapping schemes illustrated in Nokia's technology tutorial:



Huawei states that selecting which scheme is used (BPSK verse QPSK) is different from selecting a particular mapped constellation point. (*Id.* at 17-18.)

Huawei objects to Nokia's "ordinary meaning" which is meant to encompass both selection of constellation schemes and the selection of constellation points. Huawei contends that such

constructions are different concepts, with different effects. Huawei contends that Nokia's "ordinary meaning" ignores the *Nautilus* standard. Huawei contends that, at best, the specification uses the term in two inconsistent ways. (Dkt. No. 72 at 19.)

At the oral hearing, Huawei agreed to the Court's proposal of "selection of constellation points."

Analysis

In the abstract, divorced from the specification, it may be that "constellation selection" may reference selection of constellation schemes or selection of constellation points. However, claims are to be interpreted in the context of the intrinsic evidence: the claims themselves, the specification, and the prosecution history. *Phillips*, 415 F.3d at 1314. Thus, "claims 'must be read in view of the specification, of which they are a part.'" *Id.* at 1314-15 (citation omitted). Further, a term's context in the asserted claim can be instructive. *Id.* at 1314. Here, the surrounding claim language and specification provide guidance such that the term is reasonably certain, and thus not indefinite. *See Nautilus*, 134 S. Ct. at 2129.

First, the claim language is not merely "constellation selection." Rather, the term in question is found in the fuller phrase "determining that channel selection and constellation selection are in use or to be used." Later claim 1, for example, recites "selecting a communication resource from resource entries corresponding to acknowledgment and negative acknowledgment states based on the determining that channel selection and constellation selection are in use or to be used…." Similar limitations are found in claims 8 and 15. As described in the patent, communication resources are selected based on constellation points, not merely which constellation scheme is used. '636 Patent 5:1-6:62, Table 2, Table 3. Further, in the instances in the specification where selection is described with regard to "constellation," beyond mere

parroting of the claim language, "selection" is described in context of "constellation" only with regard to constellation point selection: "Channel and constellation point selection among pre-configured physical uplink control channel format 1b resources takes place in the case where the user equipment receives a scheduling grant corresponding to at least one secondary component carrier" (*id*. at 6:50-54); "The method can further include communicating 130 one to four bits by selecting at least one channel and the constellation point according to at least one pre-determined mapping table" (*id*. at 8:18-21); "communicate one to four bits by selecting at least one channel and the constellation point according to at least one pre-determined mapping table" (*id*. at 9:43-46). Such usage of "selection" conforms to the repeated usage of "selection" in the patent with regard to channels and resources in which actual channels and resources are selected, not channel or resource schemes. In context of the claims and the specification, "constellation selection" relates to the concept of choosing constellation points.

When pressed at the oral hearing to identify a teaching of selection of a constellation scheme in conformance with the usage in the claim, Nokia could only identify the passage at 1:38-42 in which the QPSK constellation scheme was identified:

> The selected channel and the QPSK constellation point used can be determined based on the ACK/NACK/DTX states for the multiple downlink subframes as shown in Table 10.1-2, 10.1-3, and 10.1-4 of 3GPP TS36.213 v850.

'636 Patent 1:38-42. (Dkt. No. 85 at 46-47.) However, even in this passage it is clear that the selection relates to a selection of a constellation point, not merely the constellation scheme. Nokia further argued that to select a constellation point, a particular constellation scheme must be chosen. (*Id*. at 50.) However, even if that is the case, the specification and claims make clear that, in context, what is being selected is a constellation point and selection of only a constellation scheme does not accomplish selection of the point.

The Court construes "constellation selection" to mean "selection of constellation points."

8. **"a single mapping table design for channel selection for up to four [bits] is in use or to be used, wherein the mapping table for n+1 . . . [bits] includes the entries in the table for n . . . [bits], where n is an integer number of [bits] from 1 to 3" ('636 Patent Claims 1, 8, 15)**

Nokia's Proposed Construction	Huawei's Proposed Construction
Plain and ordinary meaning	"a single mapping table is used for channel selection for one, two, three, and four . . . [bits]" Alternatively: "a single mapping table is in use or to be used for channel selection for one, two, three, and four . . . [bits]"

The primary disputes of the parties are (1) whether a single mapping table design requires a single table or merely a single design that may have multiple tables and (2) whether the single mapping table design includes the case of one bit.

Positions of the Parties

Nokia objects to Huawei's construction for multiple reasons. Specifically, Nokia contends that Huawei (1) deletes "design" from the claims and (2) rewrites "up to four bits" as "one, two, three, and four bits."

Nokia contends that "design" is the noun in "single mapping table design" and is modified by "single mapping table." Nokia contends that the design includes a cohesiveness or nested property of mapping tables (Dkt. No. 73 at 8 (citing Dkt. No. 73-2 (Camp Decl.) at ¶34).) Nokia contends that the four bit table includes entries for three bits, so that there are no conflicting entries or ambiguities between the four bit and three bit entries. Nokia contends that a person of ordinary

skill would understand that whether this design is implemented or represented in a single table or multiple tables is irrelevant to the single mapping table design. (*Id*. at 8-9 (citing Dkt. No. 73-2 (Camp Decl.) at ¶¶32-34).)

Nokia notes that the '636 Patent expressly claims a "single mapping table design" not a "single mapping table." Nokia contends that the claims themselves define the nature of the "design:" "wherein the mapping table for n+1 ... bits includes the entries in the table for n ... bits, where n is an integer number of bits from 1 to 3." Nokia contends that the plain language covers a design, which is further defined in the claims. Nokia also notes that the specification refers to "single mapping table design" throughout '636 Patent 1:48-54; 2:43-49; 10:46-54. Nokia also points to the passage: "[a] common feature of the two solutions is that they are based on a single design." *Id*. at 6:63-64. Nokia contends that omitting "design" from the claim would be inaccurate and improper. Nokia contends that a single mapping table design may be implemented in a single table, but splitting that same table into separate pieces would still reflect the same mapping table design. Nokia contends that the invention of the '636 Patent was designing the mapping tables for different bit patterns in a nested fashion using a single design. (Dkt. No. 69 at 22.) Nokia contends that there is nothing in the patent that limits the implementation of the mapping table design to a single table.

Finally, Nokia contends that "mapping table design" was also used consistently during 3GPP standardization by numerous companies considering and competing with the invention of the '636 Patent to include multiple tables. (Dkt. No. 69 at 22-23.) Nokia contends that Huawei's own submission used the words "mapping table design" and presented multiple tables. (*Id*. (citing 69-12 (R1-105245) at 1).) Nokia contends that this demonstrates that a person of ordinary skill

understood the plain and ordinary meaning of "single mapping table design," and that it does not mean just a single mapping table.

As to "up to four [bits], "Nokia contends that Huawei again ignores the actual claim language when it argues that "up to four bits" means "one, two, three, and four bits." Nokia does not dispute that the patent states "a single design is applicable to 1-4 bits" (Dkt. No. 73 at 9.) However, Nokia contends that the remaining claim language, "wherein the mapping table for n+1 . . . [bits] includes the entries in the table for n . . . [bits], where n is an integer number of [bits] from 1 to 3," makes clear that there is no noe bit table (*Id*. (citing Dkt. No. 73-2 (Camp Decl.) at ¶¶32-34).) Nokia states, however, there is a two bit table that includes entries for one bit when "n=1." (*Id*.) Thus, the claims are applicable to one bit without requiring a one bit table. Nokia contends that Huawei's proposed construction effectively attempts to rewrite the claim to state that "n is an integer number of bits from 0 to 3." (Dkt. No. 69 at 23.) Nokia contends this is consistent with the specification: "[c]hannel selection enables transmission of 2-4 bits" '636 Patent 1:37.

Huawei contends that the claim language makes clear that a single mapping table is used:

> determining that a single mapping table design for channel selection for up to four bits is in use or to be used, wherein ***the mapping table for n+1*** acknowledgment, negative acknowledgment and/or discontinuous transmission bits includes ***the entries in the table for n*** acknowledgment, negative acknowledgment and/or discontinuous transmission ***bits***, where ***n is an integer number of bits from 1 to 3***;

'636 Patent Claim 1 (emphasis added). Huawei contends that the claim recites two variables: "n + 1" and "n," and three possible integer values for "n:" one, two, and three. Huawei contends that substituting the numbers "1," "2," and "3" into the limitation in place of the letter "n" yields:

- The mapping table for 4 bits includes the entries in the table for 3 bits (n = 3 case);
- The mapping table for 3 bits includes the entries in the table for 2 bits (n = 2 case); and
- The mapping table for 2 bits includes the entries in the table for 1 bit (n = 1 case).

Huawei contends that the verb "includes" links the three permutations and gives meaning to the word "single," which defines the claimed mapping table. Huawei contends that the mapping table for four bits includes the entries in the table for three bits, two bits, and one bit. (Dkt. No. 72 at 20.) Huawei contends that Nokia agrees, as Nokia stated that "the invention of the '636 Patent was designing the mapping tables for different bit patterns in a nested fashion using a single design." (Dkt. No. 72 at 20 (citing Dkt. No. 69 at 22).) Huawei contends that Nokia argues that the single mapping table includes the entries for two, three or four bits, but not for one bit. (Dkt. No. 72 at 20.)

Huawei contends that the specification conforms to its use of the "single mapping table is used for channel selection for one, two, three, and four bits:" "[a]dditionally, in this example, a single design is applicable to 1-4 bits" ('636 Patent 5:43-44) and "[a] common feature of the two solutions is that they are based on a single design, the single design being applicable to 1-4 bits" (*id*. at 6:63-65). Huawei also points to Table 2 which shows the concept of a single table:

TABLE 2

Rel-8 TDD, modified.

PCC	SCC			PUCCH A/N resource (h#)	Data
b0	b1	b2	b3	RS&Data	Const.
D	N/D	N/D	N/D	DT	
N	N/D	N/D	N/D	0	1
A	N/D	N/D	N/D	h0	−1
N/D	A	N/D	N/D	h1	−i
A	A	N/D	N/D	h1	i
N/D	N/D	A	N/D	h2	1
A	N/D	A	N/D	h2	i
N/D	A	A	N/D	h2	−i
A	A	A	N/D	h2	−1
N/D	N/D	N/D	A	h3	1
A	N/D	N/D	A	h0	−i
N/D	A	N/D	A	h3	i
A	A	N/D	A	h0	i
N/D	N/D	A	A	h3	−i
A	N/D	A	A	h3	−1
N/D	A	A	A	h1	1
A	A	A	A	h1	−1

1 bit
2 bits
3 bits
4 bits

’636 Patent Table 2 (columns 3 and 4) (emphasis added). Huawei contends this conforms to the distinction made in the patent over the prior art in which the invention was distinguished over the prior art REl8-TDD based solution: “[i]n order to avoid this timing uncertainty [of the Rel-8 TDD-based solution], the same multiplexing mapping table can be applied regardless of the number of downlink component carriers (CCs) configured.” ’636 Patent 3:21-28.

As to the word “design,” Huawei contends the term does not modify “single mapping table,” and thus, Huawei removed it to simplify the term for the jury. (*Id*.) Huawei contends that Nokia attempts to use the word “design” to ignore the word “single.” Huawei contends that Nokia’s argument contradicts the very invention of the ’636 patent. (*Id*. at 23.) Huawei contends that the patent distinguishes the prior art Rel-8 TDD-based solution having “separate mapping table[s],” and claims to solve the “timing uncertainty” resulting from having separate mapping tables, by applying “the same [] mapping table . . . regardless of the number of downlink component carriers (CCs) configured.” ’636 Patent 3:21-28. Huawei contends that the “same” mapping table is the claimed “single” mapping table solution. Huawei contends that Nokia’s construction excludes all disclosed embodiments. Huawei contends that the adjective “single” meaningfully modifies the noun “mapping table.” “Single” also has a well-understood meaning within the art, and the specification confirms that meaning. (Dkt. No. 72 at 23 (citing ’636 pat. 3:21-28 (“the same [] mapping table”), 5:43-49, 6:63-66 (“the single design [is] applicable to 1-4 bits”), Table 2, Table 3 (channel selection and enhanced channel selection are combined in this single mapping table)).) Huawei contends that Nokia’s extrinsic evidence refers only to “mapping table design” and not “single mapping table design.” (*Id*. (citing Dkt. No. 69 at 22-23).)

Analysis

As to "single mapping table," the parties in essence dispute whether "single" modifies "design" or modifies "mapping table." Nokia contends that a single design may have multiple tables, a differing table for each bit. In contrast, Huawei contends that the table design is a design having a single mapping table.

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Phillips,* 415 F.3d at 1314. (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc)). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Id.* (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *Teleflex, Inc. v. Ficosa N. Am. Corp.,* 299 F.3d 1313, 1325 (Fed. Cir. 2002). Such is the case here. In context of the specification as a whole, Huawei provides the more proper reading of the claim term.

The totality of the specification is presented as a solution which provides a single table for channel selection. The prior art is described as having a "separate mapping table for the cases of two, three and four bits." '636 Patent 3:21-22. The specification then provides multiple embodiments. The embodiment of Table 2 provides a single mapping table solution. As shown in the table and described in the specification, the table nests the solutions for one bit, two bits, three bits, and four bits within a single table:

TABLE 2

Rel-8 TDD, modified.

PCC	SCC			PUCCH A/N resource (h#)	Data	
b0	b1	b2	b3	RS&Data	Const.	
D	N/D	N/D	N/D	DT		
N	N/D	N/D	N/D	0	1	1 bit
A	N/D	N/D	N/D	h0	−1	1 bit
N/D	A	N/D	N/D	h1	−i	2 bits
A	A	N/D	N/D	h1	i	2 bits
N/D	N/D	A	N/D	h2	1	3 bits
A	N/D	A	N/D	h2	i	3 bits
N/D	A	A	N/D	h2	−i	3 bits
A	A	A	N/D	h2	−1	3 bits
N/D	N/D	N/D	A	h3	1	4 bits
A	N/D	N/D	A	h0	−i	4 bits
N/D	A	N/D	A	h3	i	4 bits
A	A	N/D	A	h0	i	4 bits
N/D	N/D	A	A	h3	−i	4 bits
A	N/D	A	A	h3	−1	4 bits
N/D	A	A	A	h1	1	4 bits
A	A	A	A	h1	−1	4 bits

D = DTX,
A = ACK,
N = NACK

’636 Patent 4:27-6:5. It is a single table, such as this, that is referenced throughout the patent as a single mapping table design. Nowhere does the written specification reference a single design, where the design is separate tables. Similarly, the figures reference “a single mapping table.” ’636 Patent Figure 1, Block 135. In two passages, the specification does reference “a single design.” ’636 Patent 5:43-44, 6:63-65. However, in each case, those passages are making reference to a design in which a single mapping table is utilized. *Id*.

Furthermore, the portions of the claim term following “single mapping table design” provide additional guidance that a single mapping table is being referenced.

> determining that ***a single mapping table design*** for channel selection for up to four bits is in use or to be used, wherein ***the mapping table for n+1*** acknowledgment, negative acknowledgment and/or discontinuous transmission bits includes ***the entries in the table for n*** acknowledgment, negative acknowledgment and/or discontinuous transmission ***bits***, where ***n is an integer number of bits from 1 to 3***;

’636 Patent Claim 1 (emphasis added). As recited, “the mapping table” for the higher numbered bits includes the entries in “the table” for the lower number bits. Thus, for example, the one, two and three bit entries are included in the same mapping table used for four bits.

At the oral hearing, Nokia argued that the problem presented in the patent could be equally solved by a single design of multiple coordinated tables. (Dkt. No. 85 at 57.) The more relevant question for the Court, however, is what is meant by "single mapping table design" in context of the intrinsic record? As noted above, the specification does not support Nokia's position. At the oral hearing, Nokia itself even acknowledged that the patent does not provide an explicit example of using multiple tables. (*Id*. at 53.) Rather, Nokia argued that the concept was "implied" in the passage: "A common feature of the two solutions is that they are based on a single design, the single design being applicable to 1-4 bits." '636 Patent 6:63-65. The Court finds that this passage does not teach using multiple tables, rather, in context the passage references the solution of Tables 2 and 3, each of which are separate solutions that are a design having all the bits within a single table. *Id*. at 4:38-5:2, 6:6-36. In context of the overall intrinsic record, the Court finds that Nokia's position is not supported.

As to the issue of whether the table applies to one bit, the claim itself states that the single mapping table design is "for up to four bits." Thus, a single table is utilized for one, two, three, and four bits. As discussed above, this conforms to the specification. As claimed, the "n+1 bits" and "n is an integer number of bits from 1 to 3" does not modify the up to four bits. Rather, such language merely describes the nesting concept that two bits includes the entries for one bit, that three bits includes the entries for one and two bits, and that four bits includes the entries for one, two and three bits.

The Court proposed the construction below at the oral hearing. Huawei agreed to that construction. (Dkt. No. 85 at 54-55.)

The Court construes "a single mapping table design for channel selection for up to four [bits] is in use or to be used, wherein the mapping table for n+1 . . . [bits] includes the

entries in the table for n . . . [bits], where n is an integer number of [bits] from 1 to 3" to mean "a design having a single mapping table for channel selection for one, two, three and four bits is in use or to be used, wherein the mapping table for n+1 . . . [bits] includes the entries in the table for n . . . [bits], where n is an integer number of [bits] from 1 to 3."

9. "bits" ('636 Patent Claims 1, 3, 8, 10, 15, 17)

Nokia's Proposed Construction	Huawei's Proposed Construction
Plain and ordinary meaning	"binary digits"

The parties have not raised a dispute as to this term with regard to how one skilled in the art would interpret the term.

Positions of the Parties

Nokia contends the parties and their experts agree that "[b]it was a well understood concept, and nothing in the '636 patent appears to alter the ordinary meaning of the term." (Dkt. No. 73 at 10 (citing (Dkt. No. 72-1 (Akl Decl.) at ¶66; Dkt. No. 73-2 (Camp Decl.) at ¶43.) Nokia's expert stated:

> 44. The term is used repeatedly in the '636 Patent, and in that context, a POSITA would understand "bits" as a two-state representation

(Dkt. No. 73-2 (Camp Decl.) at ¶44.) As to various dictionaries relied on by Huawei, Nokia's expert states:

> 47. Those dictionaries then go on to define bits consistent with its plain and ordinary meaning of a two-state representation.

(*Id*. at ¶47.)

Huawei contends that the usage in the claim of "up to four bits" would readily be understood to be four binary digits. Huawei contends this is shown in Tables 1, 2 and 3 (columns

3-6) of the patent and described as 1-4 bits. (Dkt. No. 72 at 24.) Huawei contends that extrinsic evidence dictionaries show that in ordinary usage "bits" is a contraction of the term "binary digits." (*Id*. at 25 (citing six technical dictionaries and Akl declaration).) At the oral hearing, Huawei agreed that Nokia's plain and ordinary meaning of "a two state representation" was correct. (Dkt. No. 85 at 60.) Huawei stated that it merely sought construction so that the jury would not be confused with the usage of term "bits" which in other contexts could mean "bits" as in "bits of cheese." (*Id*.)

Analysis

The parties are in basic agreement as to the meaning of the term. The Court finds that in context of the specification and the meaning of one skilled in the art, jury confusion will not be an issue that requires a construction. *See O2 Micro*, 521 F.3d at 1362 ("district courts are not (and should not be) required to construe every limitation present in a patent's asserted claims.")

The Court construes "bits" to have its plain and ordinary meaning.

10. "[select/selecting] a communication resource from resource entries corresponding to acknowledgment and negative acknowledgment states" ('636 Patent Claims 1, 8, 15)

Nokia's Proposed Construction	Huawei's Proposed Construction
Plain and ordinary meaning	"[select/selecting] a PUCCH communication resource based on acknowledgment and negative acknowledgment states" Alternatively: "[select/selecting] a PUCCH communication resource from resource entries corresponding to acknowledgment and negative acknowledgment states." (Dkt. No. 72 at 28.)

The parties dispute whether the resources are limited to PUCCH resources.

Positions of the Parties

Nokia contends that the patent never uses the term "selecting a PUCCH communication resource." Nokia contends, in contrast, that the specification repeatedly uses "selecting a communication resource" with no PUCCH limitation. (Dkt. No. 69 at 26 (citing '636 Patent 1:54-55; 2:44-45; 10:54-55).) Further, Nokia contends that, at best, Huawei's construction limits the claims to an exemplary embodiment.

Huawei notes that the "Field" of the patent in the Background section states "[a]cknowledgments, including affirmative acknowledgments (ACK) and negative acknowledgments (NACK), can be transmitted on a physical uplink control channel (PUCCH)." '636 Patent 1:15-18. Huawei further contends that, in the '636 patent, the single mapping table allows the UE to "report ACK/NACK associated with multiple downlink subframes during one uplink subframe." '636 Patent 1:24-28, 1:37-43. Huawei states that Nokia has not identified the communication resource selected from the single mapping table being used for something other than uplink transmission. Huawei also states that Nokia does not identify any other uplink transmission format other than PUCCH transmission in the '636 Patent. (Dkt. No. 72 at 26-27.)

Huawei further contends that the specification distinguishes the prior art Rel-8 TDD-based solution by "not[ing] that there can be timing uncertainty involved in component carrier (re-)configuration, particularly in the case of physical uplink control channel selection." '636 Patent 3:21-25. Huawei contends that the '636 patent "avoid[s] this timing uncertainty" associated with selecting the PUCCH communication resource by using the claimed single mapping table, as distinguished from the multi-table solution disclosed in the prior art. '636 Patent 3:25-28. Huawei also points to Tables 1, 2 and 3 which each have a heading "PUCCH A/N resource" indicating what is being selected using the single mapping table. (Dkt. No. 72 at 27-28.) Huawei further identifies the specification passages: "the physical uplink control channel can be selected" among

communication resource channels (h#) (’636 Patent 5:44-50), “selecting 180 channel and constellation point among preconfigured physical uplink control channel [] resources” (*id*. at 8:55-57), “select channel and constellation point among preconfigured physical uplink control channel [] resources” (*id*. at 10:25-27) and Figure 1 (180).

The parties provided no argument on this term at the oral hearing. (Dkt. No. 85 at 60.)

Analysis

As claimed, the selection is merely “selecting a communication resource.” Huawei seeks to limit the resource to the PUCCH (Physical Uplink Control Channel) communication resource. However, that particular channel is not claimed. Further, though Huawei has pointed to embodiments in the specification using that channel, Huawei has not pointed to clear language in the intrinsic record of lexicography, disavowal, or disclaimer mandating that the communication resource is limited to a PUCCH. *See GE Lighting Solutions*, 750 F.3d at 1309; *Cordis Corp.*, 561 F.3d at 1329. Rather, Huawei merely points to an embodiment of the specification. However, even a single embodiment is not necessarily enough to read a limitation into the claim from the specification. *Arlington Indus.*,, 632 F.3d at 1254 (Fed. Cir. 2011). Huawei states that the patent emphasizes the prior art had problems “particularly in the case of the physical uplink control channel selection.” ’636 Patent 3:21-25. A disavowal of claim scope based upon disparagement in the specification “requires ‘expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.’” *Epistar Corp. v. ITC*, 566 F.3d 1321, 1335 (Fed. Cir. 2009) (quoting *Teleflex Inc. v. Ficosa N. Am. Corp*., 299 F.3d 1313, 1325 (Fed. Cir. 2002)). “A patentee’s discussion of the shortcomings of certain techniques is not a disavowal of the use of those techniques in a manner consistent with the claimed invention.” *Epistar*, 566 F.3d at 1335. Moreover, here the statement that the PUCCH was “particularly” susceptible to the timing

uncertainty does not even indicate that only the PUCCH experienced such problems, but rather if anything, implies other channels may also be relevant. The Court rejects Huawei's inclusion of PUCCH within the meaning of the term. By rejecting Huawei's additional limitation, the Court has resolved the claim construction dispute. *See O2 Micro*, 521 F.3d at 1362; *Finjan*, 626 F.3d at 1207.

The Court construes the term "[select/selecting] a communication resource from resource entries corresponding to acknowledgment and negative acknowledgment states" to have its plain and ordinary meaning.

11. "spatial bundling of acknowledgement and negative acknowledgement [bits] for the first and second codeword" ('636 Patent Claims 3, 10, 17)

Nokia's Proposed Construction	Huawei's Proposed Construction
Plain and ordinary meaning	"performing a logical AND operation to obtain a value of bundled acknowledgement and negative acknowledgement [bits] for the first and second codeword"

The parties dispute whether the bundling of the acknowledgement and negative acknowledgement bits is limited to an AND operation.

Positions of the Parties

Nokia contends that Huawei attempts to replace "spatial bundling" with one particular method of implementation, "performing a logical AND operation to obtain a value of bundled," thus limiting the term to an exemplary embodiment from the specification. (Dkt. No. 69 at 28.) Nokia contends that the '636 Patent provides multiple embodiments with spatial bundling. Nokia points to: (1) "this solution has, in this example, built in support for various carrier aggregation combinations with and w/o spatial bundling (2+1, 2+1+1, 2+2, 1+1+1+1 ACK/NACK bits per component carrier). The expression, 2+1+1, corresponds to the case with 3-component carriers:

one component carrier with 2-bit ACK/NACK, and 2 component carrier with 1-bit ACK/NACK" ('636 Patent 7:31-39); (2) "[f]or ACK/NACK bundling mode, the ACK/NACK bits can be first bundled in the time domain to get one bit, or 2 bits with multiple codeword (MCW) downlink transmission" (*id*. at 1:31-33); and (3) "for example, where there are 2 spatial codewords on a component carrier, a logical AND operation is performed to obtain the value of bundled ACK/NACK" (*id*. at 5:39-42) (emphasis added). Nokia contends, a person of ordinary skill would thus understand the plain meaning of "spatial bundling" to include conveying multiple ACK, NACK, or DTX states with a single state. (Dkt. No. 69 at 28.)

Nokia contends that for example, a UE that wants to signal NACK then ACK could signal simply NACK or could signal simply ACK, so long as the base station knew how the UE was implementing spatial bundling. Nokia contends that the first example is an embodiment of a logical AND operation (ACK + NACK = NACK) and the second example above is an embodiment of a logical OR operation (ACK + NACK = ACK). (Dkt. No. 69 at 28-29.) Nokia contends that a person of ordinary skill would know, in the context of the '636 Patent, that spatial bundling could be achieved, for example, by a logical AND operation or a logical OR operation. Nokia contends that Huawei's construction would limit the claims to the single example of a logical AND. Nokia notes that the specification specifically used "for example" when describing the use of "logical AND operation:" "for example, where there are 2 spatial codewords on a component carrier, a logical AND operation is performed to obtain the value of bundled ACK/NACK" '636 Patent at 5:39-42. Nokia contends that one skilled in the art would understand that a logical OR operation could just as easily be used as a logical AND operation.

Nokia contends that Huawei and others (Fujitsu and Docomo) used the term "spatial bundling" in their 3GPP submissions without limiting the term to a logical AND operation. (Dkt. No. 69 at 29.)

Huawei contends that the '636 patent expressly defines what "spatial bundling" means: "where there are 2 spatial codewords on a component carrier, a logical AND operation is performed to obtain the value of bundled ACK/NACK." '636 Patent 5:39-41.

As to Nokia's "logical OR" example, Huawei states that such an example is not mentioned in the specification. Further, Huawei contends that such an "OR" example would not work because a combination of ACK + NACK occurs when part (the second part) of the transmission is not successfully decoded. Yet, under Nokia's "OR" example, ACK + NACK would result in an ACK, thus signaling the transmission was successfully decoded when, in fact, part was not decoded. (Dkt. No. 72 at 30.) Huawei contends that the "OR" example is thus inoperable because the base station does not know whether information needs to be retransmitted or not. Huawei contends that only "AND" solves this problem. *Id*.

The parties provided no argument on this term at the oral hearing. (Dkt. No. 85 at 60.)

Analysis

Huawei seeks to limit the bundling of acknowledgement and negative acknowledgement bits to one specific operation. Specifically, Huawei seeks to liken bundling to an operation that is a logical AND operation. Huawei has not pointed to clear language in the intrinsic record of lexicography, disavowal, or disclaimer mandating that the bundling operation is limited to an AND operation. *See GE Lighting Solutions*, 750 F.3d at 1309; *Cordis Corp.*, 561 F.3d at 1329. Rather, Huawei merely points to an embodiment of the specification. However, even a single embodiment is not necessarily enough to read a limitation into the claim from the specification. *Arlington*

Indus.,, 632 F.3d at 1254 (Fed. Cir. 2011). Moreover, even the one example from the specification, which Huawei seeks to add, is prefaced with "[t]hus, ***for example***, where there are 2 spatial codewords on a component carrier, a logical AND operation is performed to obtain the value of bundled ACK/NACK." '636 Patent 5:39-41. Such language is indicative that other conditions may apply and the invention is not limited to AND operations. By rejecting Huawei's additional limitations, the Court has resolved the claim construction dispute. *See O2 Micro*, 521 F.3d at 1362; *Finjan*, 626 F.3d at 1207.

The Court construes "spatial bundling of acknowledgement and negative acknowledgement [bits] for the first and second codeword" to have its plain and ordinary meaning.

CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patents-in-suit. The parties are ordered to not refer to each other's claim construction positions in the presence of the jury. Likewise, in the presence of the jury, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court. The Court's reasoning in this order binds the testimony of any witnesses, and any reference to the claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

SIGNED this 19th day of May, 2017.

ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE